Before the
Federal Communications Commission
Washington, D.C.

In the matter of:

Petition for Rulemaking to Allow the MA3 All-Digital Mode of HD Radio for AM Stations	)))))	**RM-11836**

To: Office of the Secretary
Attn: The Commission

COMMENTS OF SCOTT FYBUSH

Scott Fybush hereby submits these comments in response to Bryan Broadcasting's Petition for Rulemaking in the above-captioned proceeding:

QUALIFICATIONS

Fybush has worked in broadcasting since 1991 in multiple capacities. As a journalist and analyst covering the broadcast industry, Fybush has edited or written for trade publications including The Radio Journal, Radio World, Radio Guide, RadioInsight, Current, and since 1994 his own *NorthEast Radio Watch* (www.fybush.com), covering broadcast engineering, technology, regulatory and business issues.

As a consultant, Fybush has advised station owners and groups on signal improvement and acquisition strategy. Through his website StationSale.com, Fybush assisted station owners in buying and selling FM translators during the "AM Revitalization" window that opened in January 2016. During the Auction 99 and Auction 100 translator windows, Fybush provided technical consultation services to more than a dozen broadcasters, filing for new translator facilities for some 20 AM stations in large and small markets around the country.

Since 2000, Fybush has profiled broadcast facilities on the weekly Tower Site of the Week page and in the annual "Tower Site Calendar," with special attention to the history of AM transmission in the United States. He has visited and studied thousands of broadcast facilities from coast to coast. Fybush (hereinafter, "Commenter") is a member of trade organizations including the Society of Broadcast Engineers and the National Association of Media Brokers. His comments here are strictly his own.

COMMENTS

1. Commenter fully supports and endorses Bryan Broadcasting's proposal to allow AM licensees the option of converting to all-digital operation using the MA3 HD Radio mode.

2. For all the history and romance that surrounds traditional analog AM broadcasting as it approaches its centennial, the facts continue to show that AM has reached, and perhaps passed, full maturity as a broadcast medium. The Commission's own records amply indicate that construction of new AM facilities has all but ceased. As the values of AM licenses continue to fall, an increasing number of licensees are selling their transmitter sites for the value of the underlying land, often diplexing or triplexing with other nearby AM broadcasters and accepting reduced signal coverage as a result.[1] The advent of FM translators in the Auction 99 and Auction 100 windows gave many broadcasters a path to new audiences for their programming on the FM band; the marketplace has clearly spoken with respect to consumer preference, with even some 50,000-watt class A AM signals promoting their FM translator frequencies in preference to their AM dial position[2].

3. Traditional analog AM lacks much of the functionality consumers demand from their audio entertainment sources in 2019. A rising noise floor has made reception increasingly challenging in both stationary and mobile environments. Even where AM signals remain robust and reception is clear, analog AM broadcasts lack the title-and-

[1] cf. WBBM, Chicago; WMAL, Washington; KABC, Los Angeles; WWTC, Minneapolis

[2] KOA, Denver now promotes its 250-watt 94.1 translator equally with its 50,000-watt AM frequency; KFBK, Sacramento demotes its 50,000-watt AM 1530 frequency to small print beneath a logo proclaiming "FM 93.1 KFBK" for its full-power FM simulcast.

artist functionality offered by RDS/RBDS on analog FM, much less the graphic displays offered by almost all digital audio entertainment sources, including streaming audio, satellite radio and even HD Radio on FM. With space on the dashboard increasingly at a premium, automakers have begun considering eliminating AM from car radios entirely, which could pose an even greater existential threat even to AM broadcasters who have remained successful on the senior band. Even the most compelling programming cannot succeed if potential listeners are purchasing new cars that lack any ability to receive the signals on which they are broadcast.

4. While the HD Radio system has had mixed success in the years since its approval, it has begun to show signs of reaching a critical mass. While receivers remain far from universal in cars, commenter's anecdotal experience has been that they are becoming more standard in vehicles of recent vintage.

5. Although other digital broadcast systems such as Digital Radio Mondiale (DRM) have shown technical merit, it is only the HD Radio system that exists in sufficient quantity in today's installed receiver base to make digital conversion a viable option for broadcasters seeking to reach a real-world audience in the United States and not just conduct a science experiment that few, if any, potential listeners can actually hear. Because MA3 all-digital reception capability has been built into the standard HD Radio chipset since HD Radio was first commercially approved, millions of cars are now traveling American roads with the ability to receive all-digital AM radio already installed.

6. Commenter had the opportunity to drive one such vehicle, a factory-stock 2014 Toyota Corolla, on several recent trips through the coverage area of WWFD, Frederick, MD during its tests of the MA3 all-digital mode. While no formal controlled testing was conducted, commenter listened extensively to the WWFD signal while traveling southbound on December 26 and 27, 2018 and even more extensively while traveling through and northward from the Washington, DC area in early March 2019. That trip included a visit to the WWFD transmitter site and an inspection of the facility[3].

[3] Audio of in-car reception, along with an interview with WWFD engineer Dave Kolesar and engineer Mike Raide of Xperi Corp. may be heard at commenter's "Top of the Tower" podcast, www.fybush.com/podcast-035/. Commenter reiterates that he has no business relationship with WWFD, Hubbard Radio or Xperi Corp.; all opinions expressed here are strictly his own.

7. Through frequent travel to the area, commenter was familiar with the extent of WWFD's usable coverage area when broadcasting in analog. As with most AM stations in the 21st century, WWFD in analog was usable to a typical listener only within its 5 mV/m contour, which does not even encompass the entirety of Frederick County, its home county. As with most AM stations, especially in the crowded east, the additive nature of AM interference frequently makes several co-channel stations, including WNYC New York and WNTW Chester, Va., audible underneath WWFD in fringe areas, especially during critical hours. For drivers on the busy I-270 corridor, WWFD's analog signal ceases to be viable during the day 15 to 20 miles short of the Washington Beltway, rendering it useless to the many commuters headed to Washington and its suburbs.

8. In December 2018, commenter first attempted to tune in WWFD's digital signal while parked at a convenience store[4] in York, PA, some 55 miles from the WWFD transmitter site where WWFD's predicted daytime field strength is approximately 0.3 mV/m. Tuning the car radio to 820 AM produced a brief silence, followed by a solid lock on WWFD's digital audio and text data. While the audio was mono and heavily compressed due to low bitrate, it was of a quality that commenter believes would be acceptable to most contemporary listeners, free of noise and with wider frequency response than typical analog AM audio[5].

9. Subsequent listening tests at the fringes of WWFD's signal in December and March produced similar results at various locations in Pennsylvania and Maryland. The signal was spotty but generally usable around the Baltimore beltway and quite usable on Baltimore's TV Hill, areas where WWFD's predicted daytime field strength is also approximately 0.3 mV/m. In urban areas of northwest Washington, at the edge of WWFD's 0.5 mV/m contour, the MA3 all-digital signal was almost consistently usable while driving. Commenter checked the analog signal of WFMD, Frederick, a 5 kW signal at a neighboring location to WWFD, and found it entirely unlistenable in those same areas on the same Toyota radio.

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[4] Specifically, a Sheetz at South Queen Street and I-83.

[5] Commenter's March 1-5, 2019 observations of WWFD were made shortly before the installation of a new Nautel XR6 transmitter. At the time these observations were made, WWFD was operating with 20 kbps bitrate in mono; it is commenter's understanding that WWFD now operates with 36 kbps, broadcasting in stereo with low-powered outer carriers expected to have a more limited range than the mono signal.

10. Even at the far fringes of WWFD's signal, there were areas where it remained usable at startlingly low signal levels. At the southern 0.15 mV/m contour, commenter found areas along US 301 near St. Charles, Maryland, 75 miles from the transmitter site, where WWFD would still lock in with a completely clear digital signal in March. To the north, WWFD remained solidly listenable in the York area and continued to lock in digital in spots around Harrisburg, at the 0.15 mV/m contour some 70 miles from WWFD. Along the Susquehanna River north of Harrisburg, WWFD's signal finally ceased to provide enough digital data to lock the Toyota receiver; when it reverted to analog mode, it became clear that during critical hours, the co-channel signal from WNYC in New York was being heard with just enough strength to overcome WWFD in digital[6].

11. Commenter also listened briefly for the effect of WWFD's MA3 all-digital signal on adjacent channels. Unlike the previous MA1 hybrid mode for AM digital operation, the MA3 mode produced far less interference, as expected. In Prince Georges County, Maryland, WYRE on 810 kHz from Annapolis remained audible, albeit noisy, in areas around its predicted 0.5 mV/m daytime contour. WYRE was also audible in Baltimore, where its predicted signal is approximately 0.8 mV/m, but appeared to suffer far more heavily from urban electrical interference than from WWFD. In Pennsylvania, commenter listened to WEEU on 830 kHz from Reading, traveling along its 0.5 mV/m contour through Harrisburg. Despite being in WEEU's null toward WWFD, the WEEU signal was at least barely usable, though noisy, in areas where WWFD continued to lock in digital.

12. From the standpoint of ease of use by average listeners, no special effort was needed to receive the broadcast in an otherwise generic vehicle; as soon as the radio was tuned to AM 820, data began to appear on its screen and audio locked in within seconds at a sound quality comparable to the compressed digital audio tens of millions of listeners

[6] Commenter was not in a position to evaluate the MA3 signal at night, not being within range of WWFD's 430-watt night signal. Anecdotal evidence suggests the MA3 signal carries during critical hours via skywave, with listener reports of digital audio lock in Pittsburgh and central Connecticut and at least one report of data, but no audio, in Rochester, NY. During earlier tests of the MA3 system, commenter was able to receive digital audio from WBT, Charlotte in Rochester. Commenter regularly monitors DX listener reports in several club bulletins and mailing lists; unlike the MA1 system, where adjacent-channel interference to analog signals remains a common topic of reports and complaints, no reports of interference from WWFD have been noted.

are accustomed to hearing on satellite radio, streaming or MP3 files. Moreover, the MA3 all-digital signal did not exhibit any of the characteristics (limited frequency response, electrical interference) commonly cited by average listeners as reasons to avoid analog AM radio in the 21st century.

13. Commenter is well aware of the risks and expenses faced by broadcasters considering the all-digital MA3 mode: many older AM facilities will require modification to pass the full bandwidth of the digital signal; most stations that had not been operating in the MA1 hybrid mode would need to purchase new transmission equipment to transmit digitally; and of course a switch to all-digital operation on AM makes it impossible for at least half (and likely more) of the current listener base to receive the signal until or unless penetration of digital receivers continues to improve.

14. Nevertheless, the ailing state of AM radio in 2019 has left hundreds - or perhaps even more - AM signals limping along with such small analog audiences that broadcasters such as Hubbard, Bryan Broadcasting and several of commenter's own clients are willing to take on those risks and expenses in an attempt to find some degree of late-stage viability in their otherwise all-but-defunct AM signals. So long as any transition is purely voluntary, market forces will keep AM stations that remain viable broadcasting in analog for some time to come. Only the stations (such as WWFD) that have effectively completely lost an analog audience are likely to pursue an early switch to all-digital; almost by defnition, those stations are unlikely to be missed by any but the smallest few existing listeners. While this proceeding falls under the umbrella of "AM Revitalization," this specific matter will not be a panacea for the entirety of AM broadcasting, just a means for some small fraction of existing AM broadcasters to seek a new use for signals the marketplace has otherwise already deemed non-viable in analog.

15. In conclusion, while there are still questions yet to be fully answered about real-world deployment of MA3 all-digital, particularly the effects of nighttime skywave on interference among multiple MA3 all-digital signals and between digital and analog co-channel signals, commenter believes the record of MA3 experimentation thus far supports the expansion of the mode into licensed non-experimental use. The combination of relatively widespread receiver availability and a growing number of non-viable AM stations has created marketplace conditions that make broadcasters willing to accept the

risks and expenses of all-digital operation. The authorization of voluntary all-digital MA3 operation on the AM dial is consistent with the Commission's marketplace-driven policymaking, and should be approved expediently as one of many tools in the "AM Revitalization" toolkit to maintain whatever viability remains in the AM dial.

Respectfully,

/s/

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